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Observables Characterization Data Center Facility Implementation Plan

April 15, 1986

Prepared for
Strategic Defense Initiative Organization/
Directed Energy Division
Through an Agreement with
National Aeronautics and Space Administration
by

JPL

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

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Observables Characterization Data Center Facility Implementation Plan

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SECTION 1

DATA CENTER FACILITY OVERVIEW

The concept of a classified central data repository to focus user activity, expedite experimental design, and minimize redundant effort within the Acquisition, Tracking, and Pointing (ATP) Program originated within the Strategic Defense Initiative Organization's Directed Energy Division (SDIO/DE). This idea is developed in this Implementation Plan as a concept and as a systematic way of proceeding to implement the intent of the SDIO/DE.

The proposed Observables Characterization (OC) Data Center Facility (DCF) is part of the ATP Program sponsored by the SDIO/DE. The purpose of the DCF is to establish a focal point for the collection and dissemination of experimental data for ATP activities. Another important purpose of the DCF is to enable the SDIO/DE to compare and evaluate experimental results more efficiently. The DCF may also serve as a center for analysis and as a distribution point for validated data and scenes. Finally, the DCF is expected to provide an invaluable planning base for the SDIO/DE.

The relationship of the DCF Task to the other components of the larger OC Task into which it is incorporated is shown in Figure 1-1. The other OC Task components are not discussed in this report except as they relate conceptually to the DCF.

The ATP Program is funded by the SDIO. The OC Task, which is being conducted by the Jet Propulsion Laboratory (JPL) for SDIO/DE, will support the ATP Program objectives by providing SDIO/DE with a validated database of ATP observables. The task will also identify any deficiencies in the data now being collected.

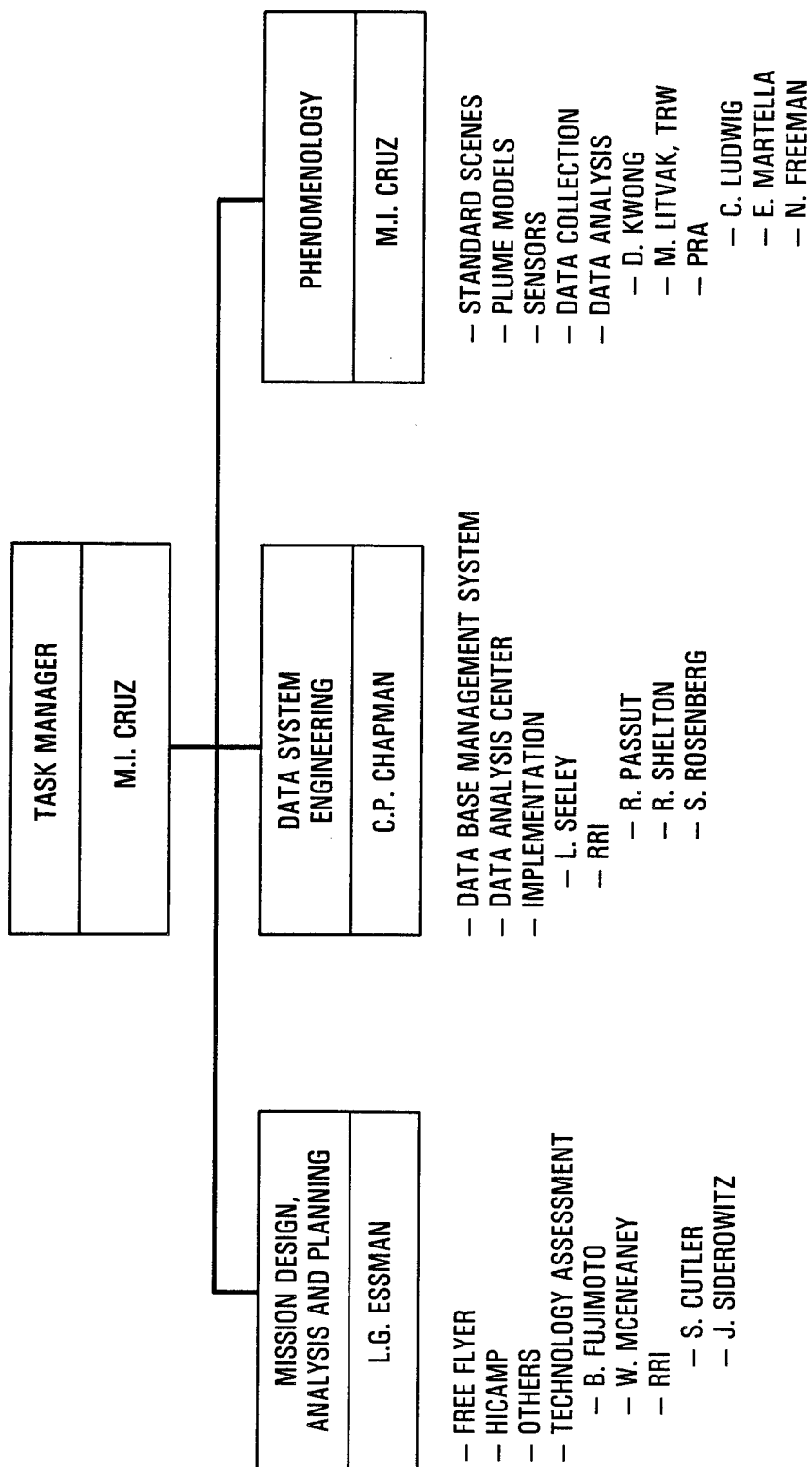


Figure 1-1. Task Organization

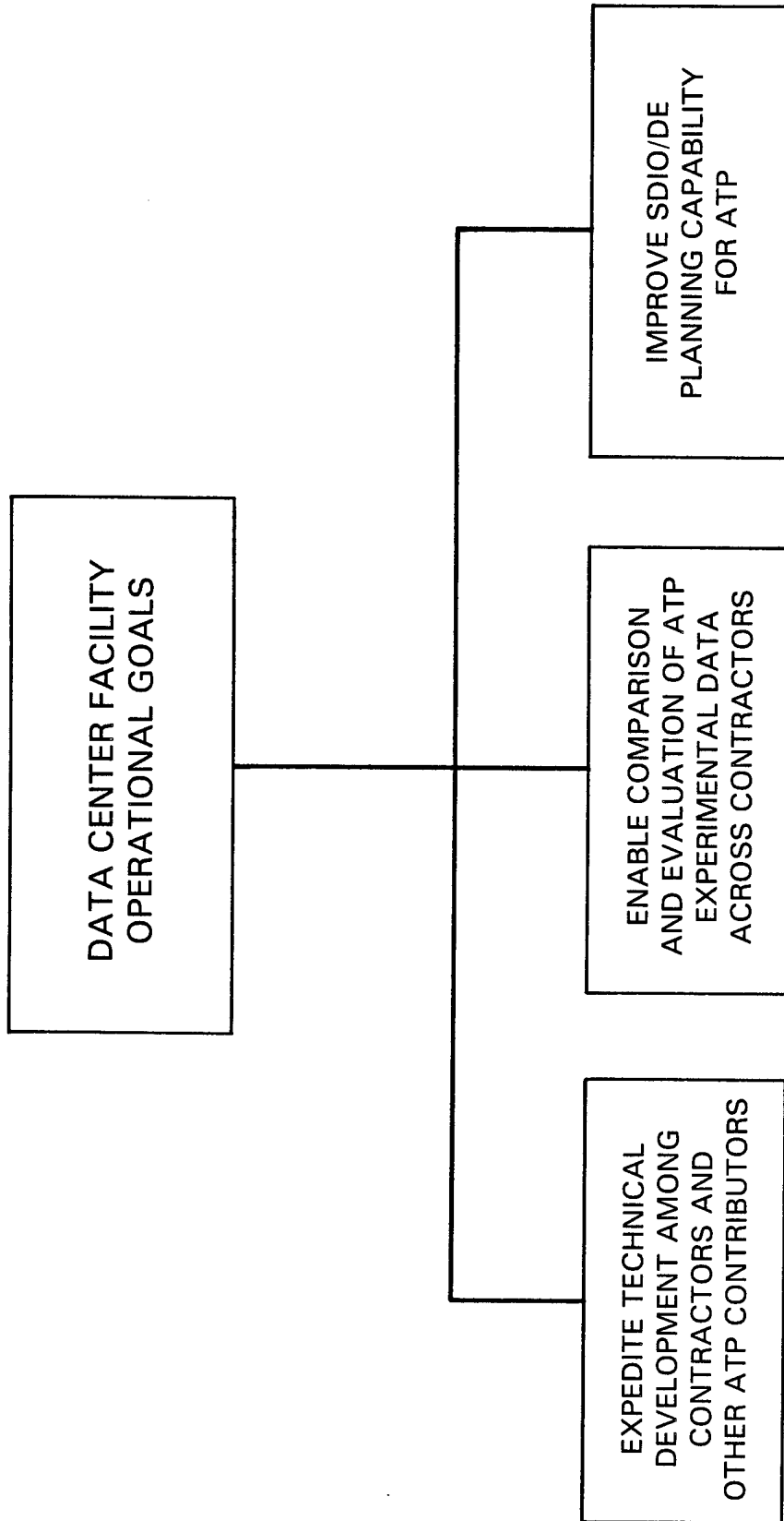
SECTION II

PRIMARY GOALS OF THE DATA CENTER FACILITY

There are three non-prioritized, primary goals of the Data Center Facility (DCF), as shown in Figure 2-1. The first goal is to expedite technical development among contractors and other ATP contributors by collecting, standardizing, and distributing validated experimental data and results. These functions should more precisely direct experimental effort and reduce redundant and ineffective lines of inquiry.

A second goal is to enable comparison and evaluation of ATP experimental data across the ATP community by the SDIO/DE. A centralized collection point for phenomenology data, documents, and other information will enable not only efficient and cost-effective technical communication among ATP experimenters but also provide an efficient and cost-effective way of evaluating the relative merits of experimental approaches and results.

The third goal is to supply SDIO/DE with a planning capability for all ATP experiments by providing both access and visibility into the state of the art of the overall ATP experimental effort. The central focus that the DCF will provide should substantially ease the burden of tracking experimental results and planning for the technological breakthroughs required by the ATP effort.



ATP: ACQUISITION, TRACKING, AND POINTING
SDIO/DE: STRATEGIC DEFENSE INITIATIVE ORGANIZATION/DIRECTED ENERGY

Figure 2-1. Data Center Facility Operational Goals

SECTION III

FUNCTIONAL OBJECTIVES OF THE DATA CENTER FACILITY

One objective of the SDIO ATP Program is to develop a comprehensive and focused set of space experiments relating to the ATP Mission; therefore, the planning of these experiments will result in the evolution of standards such as standard scenes. The DCF is envisioned as a central location for the collection and distribution of the experimental data necessary to evaluate the feasibility of technologies required to support a national strategic defense system.

Other services that are of value include the validation of experimental data, establishment of data standards across experiments, and technical mission planning support. The DCF will be a repository of data, standard scenes, models, and algorithmic functional entities that will assist in the analysis of ATP observables data across the broad spectrum of interested users.

The task includes the collection of plume predictive code information from within the ATP community. An attempt will be made to validate all data and models collected to raise the confidence level for all subsequent experimental activities. Material stored at the DCF will be secure and distributed only to those users with a need to know, as specified by the SDIO and its designees.

Five performance objectives for the DCF are shown in Figure 3-1.

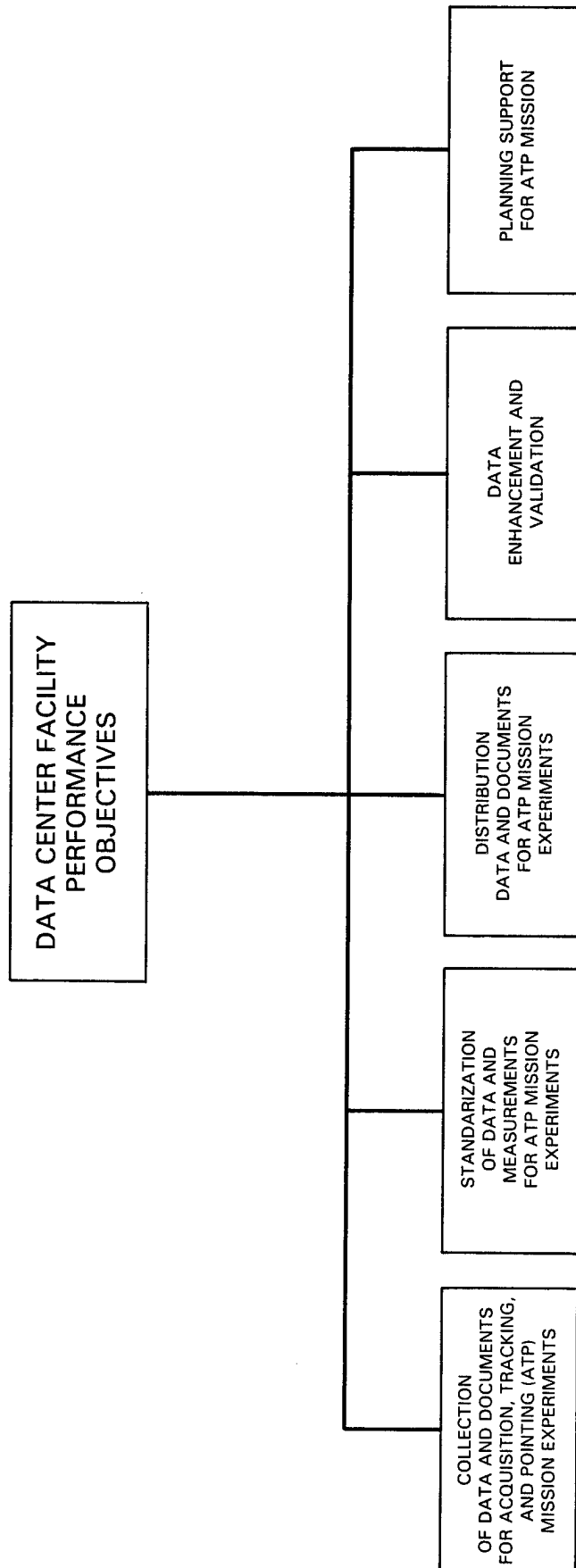


Figure 3-1. Data Center Facility Performance Objectives

SECTION IV

OPTIONS FOR DATA CENTER FACILITY DEVELOPMENT

Because of the discrepancy between the comprehensive, long-range objectives of the DCF and the immediate need for such a facility, a phased approach to its implementation is warranted. In this section an option approach for DCF development is proposed.

A. OPTION A: REPOSITORY AND DISTRIBUTION

For the initial option of DCF development, secure storage, data and document indexing, and dissemination of SDIO/DE data from experimenters will be provided. The primary capabilities immediately available will be:

- (1) A secure repository for data, documents, and knowledge.
- (2) An automated central and remote index of ATP/DE experiment data, documents, and knowledge.
- (3) A distribution facility for SDIO/DE and experimenters.

B. OPTION B: MULTI-MEDIA CENTER

For the second option of DCF development, a complete functional design for the final operational DCF will be specified. The DCF will also have the following capabilities, support functions, and activities:

- (1) Nominal computer facility with archiving and display capability.
- (2) Specification generation for data standardization.

C. OPTION C: IMPLEMENTATION OF ANALYSIS CENTER

A third option for DCF development will involve the transfer of the DCF to its final operational site. At this point, all of the operational capabilities that are part of the Option C design will be implemented. At the conclusion of the third option, the DCF would become the focus for the collection and dissemination of all ATP data and experimental results. The capability will exist to perform both data reformatting into standard formats and validation of that data. Analytic models of value will also be collected, along with algorithmic processes developed during the course of ATP experimentation that have generic value, to allow ready reference to anyone who needs access to specific experimental data. In summary, the following functions and capabilities would exist if this option were exercised:

- (1) Data analysis methodologies and algorithms.
- (2) Data correlation (prediction versus experimental data).

(3) Image processing.

(4) Model validation.

Table 4-1 summarizes the three options, indicating the required hardware and functional attributes of each option. It should be noted that Option B cannot be selected without completing Option A, and Option C cannot be implemented without finishing Option B.

Table 4-1. Option Summary

Attributes	Option		
	A	B	C
Typical system hardware	IBM/PC/XT PC-AT(s)	DEC VAX 11/750	DEC VAX 11/780,/785
No. simultaneous users (depends on activity)	1 to 3	5 to 15	20 to 50
Catalog size	1-K to 10-K records	Large-scale	Large-scale
CCT tape copies and distribution	No	Yes	Yes
CCT quality assurance	No	Yes, first level	"Reasonable" checks
Data displays	No	Simple monochrome	Extensive images
Compute power	N/A	Modest	Moderate
Support modeling efforts	No	No	Yes
Remote secure networks	No	Participate	Host center

SECTION V

USER CONTRIBUTION TO THE DATA CENTER FACILITY

To determine both the perceived need for a data center facility and identify the potential usage characteristics, a DCF questionnaire, developed by J.L and Riverside Research Institute (RRI), was distributed to approximately 40 organizations representative of potential users of the DCF. In addition to major Government contractors in the ATP effort, selected National Laboratories and appropriate non-profit research organizations were included in the distribution of the questionnaire, the purpose of which was to identify some of the specific needs of a DCF from a user's standpoint.

The questionnaire (Appendix A) was designed to determine user interest in data storage, data analysis, and image processing. It also contains queries about the preferred method of obtaining data from such a facility so that new insights into user needs might be determined. A summary of the questionnaire results is also included in Appendix A.

The DCF as a central focus for ATP experimental data and results is shown in Figure 5-1.

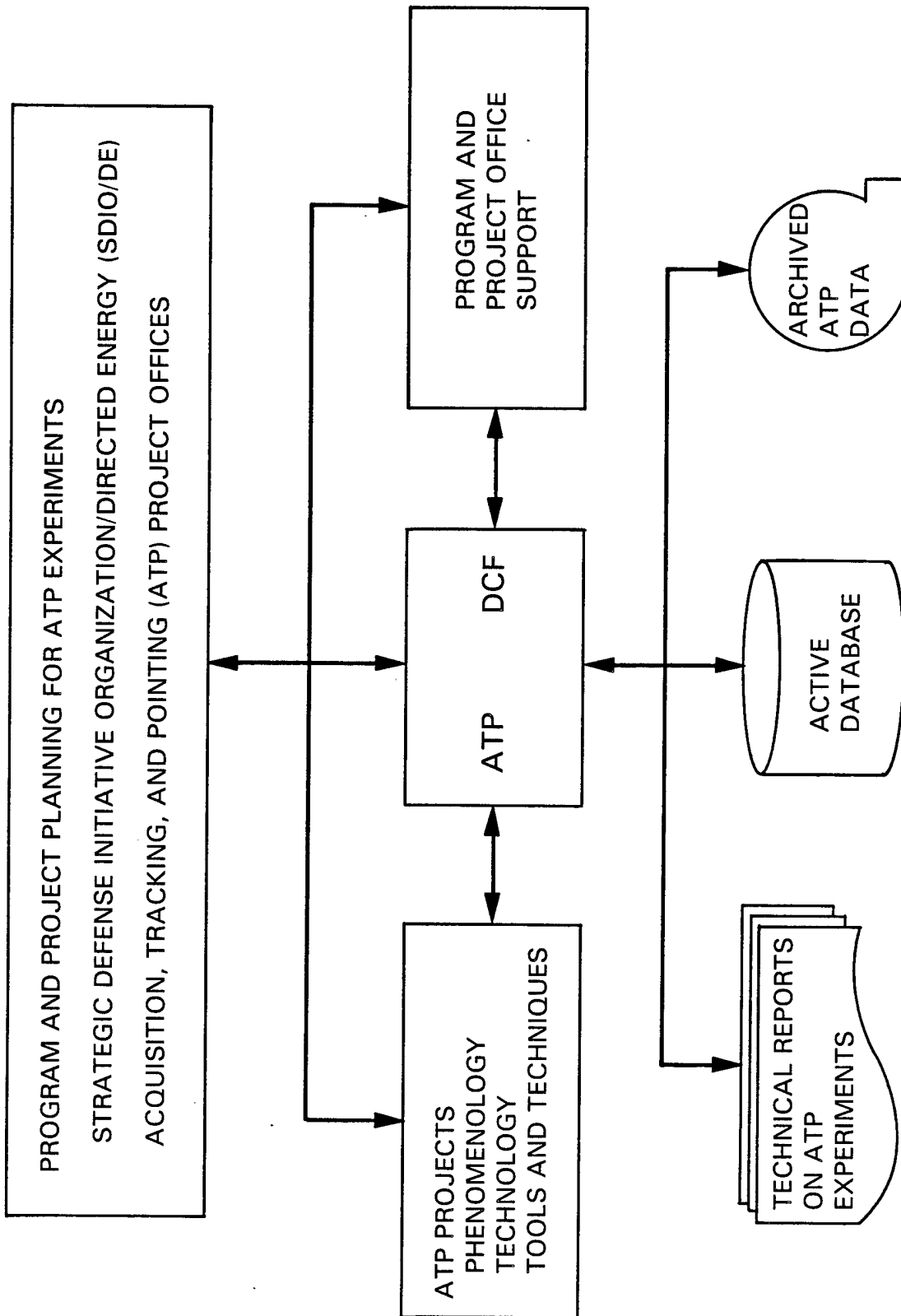


Figure 5-1. The Data Center Facility in the Acquisition, Tracking, and Pointing User Environment

SECTION VI

ROLE OF THE JET PROPULSION LABORATORY IN THE DATA CENTER FACILITY DEVELOPMENT

The role of the Jet Propulsion Laboratory (JPL) in the development of a Data Center Facility is to manage the evolutionary process of DCF development from conception through final implementation. The five major aspects of JPL's role are (Figure 6-1):

- (1) To develop and clarify the DCF concept, which involves not only helping to develop a clear definition of the goals and performance objectives but also helping to define the operational rules for DCF usage.
- (2) To establish user requirements for the DCF. This task entails defining the technical and programmatic requirements relating to the spectrum of ATP experiments.
- (3) To develop a phased implementation plan for the total DCF effort. To do this task properly, a determination of the nature and scope of the ultimate DCF is required.
- (4) To write a Request for Proposal (RFP) to industry for the development of the Data Center Facility, issue a contract for the construction of the facility, and monitor the contract performance during implementation of the development phases.

The final design will be implemented and tested at a contractor site, after which JPL's involvement in the DCF will be only that of a potential user.

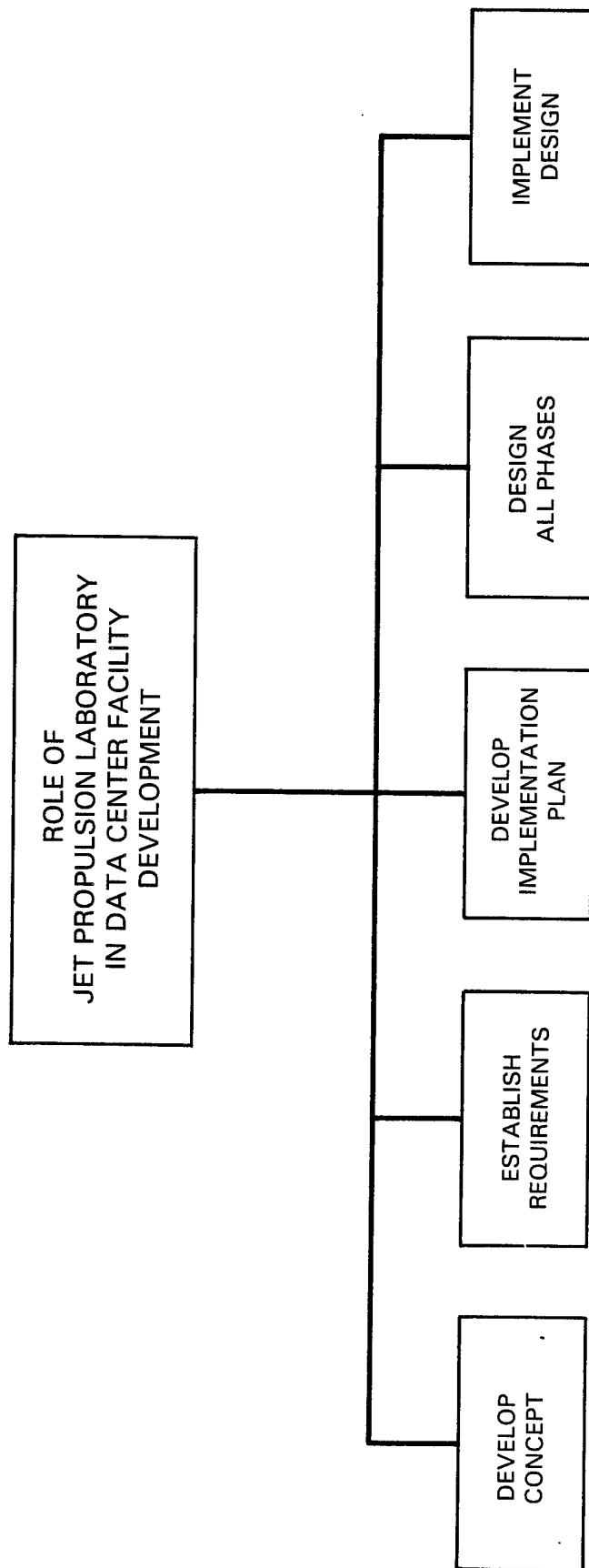


Figure 6-1. Role of the Jet Propulsion Laboratory in the Data Center Facility Development

SECTION VII

RECOMMENDATIONS AND RESOURCES

Based upon the questionnaires described in Section V and the results of a workshop held over a 2-day period at JPL, a recommendation was made that Option A and part of Option B be implemented over a phased 2-year development period. The DCF would be a document repository and information center initially employing an IBM PC-based network (Option A). After this phase is implemented, a means would be developed to provide the capability to read, store, and disseminate computer compatible tapes (CCTs) and other data media, using a mini-computer.

Figure 7-1 shows the capital equipment cost, the equipment maintenance cost, and the staffing cost to implement some or all of the options described in this report. Item 1 under Phase Description indicates the recommendation discussed above with the resources required to implement the recommendation. The phases listed in Figure 2-1 approximately coincide with the options because each option requires about 1 year to implement, using the staffing listed in Figure 7-1.

PHASE DESCRIPTION	CAPITAL PURCHASE K\$	EQUIPMENT MAINT K\$			STAFFING			YR 3		TOTAL COSTS (ROUNDED)
		YR 1	YR 2	YR 3	PM	K\$	PM	K\$	PM	
1. DOCUMENT REPOSITORY, AND INFORMATION CENTER. CCT TAPE ARCHIVING AND DISTRIB. (IBM PCs PLUS SMALL MINI)	217 (YR 1)	20	23	23	3	450	4	600	4	1900
2. MULTI MEDIA CENTER CCT AND VIDEO TAPE IMAGE DISPLAYS AND CONVERSION (MINI COMPUTER PLUS DISPLAYS)	100 YR 2 (IMAGE DISPLAYS)	0	10	12	0	0	1	150	2	600
3. IMAGE ANALYSIS CENTER DATA PROCESSING (AUGMENTED MINI W/IMAGE PROCESSOR)	700 YR 3 NEW COMPUTER SYSTEM PLUS IMAGE PROCESSOR	0	0	70	0	0	1	150	2	1200
	1,000 (3 YEARS)	20	33	105	3	450	6	900	8	3700

Figure 7-1. Data Center Facility Phased Implementation Incremental Costs

APPENDIX A
INITIAL DATA CENTER FACILITY QUESTIONNAIRE

ATP DATA BASE QUESTIONNAIRE
(Unclassified)

ORGANIZATION NAME: _____

RESPONDER'S NAME: _____

INSTRUCTIONS:

The SDIO/DE is considering establishing a classified data repository for ATP data in order to facilitate and enhance the ATP data analyses to be performed for SDIO/DE. Data collection, cataloging, and reformatting are among the possible functions of this repository or database. This questionnaire is the means by which you can express your opinion as to the usefulness of such a function to YOUR ORGANIZATION and any additional capabilities you would like to see to expand the analytical capability of your organization via this function. Please answer the questions with reference to YOUR organization. Additional comments are welcome and a space has been provided at the end of the questionnaire for such comments.

THIS FORM IS UNCLASSIFIED. PLEASE KEEP YOUR COMMENTS OR ADDITIONAL INFORMATION YOU SUBMIT UNCLASSIFIED.

1. Do you believe a data repository function would benefit your organization such that you could easily and quickly obtain other ATP experimental program results with associated documentation?

- A. YES
- B. NO

2. Would you be willing to contribute data and other information for wide distribution to other ATP analysis organizations that may be interested in the results of your work?

- A. YES
- B. NO

3. Would it be useful for you to know at all times what ATP data and other analytical information is currently available?

- A. YES
- B. MAYBE
- C. NO

DATA FACILITY QUESTIONNAIRE

4. Would your organization be willing to allocate a small computing machine (such as an IBM PC/XT/AT) for the purpose of storing and accessing knowledge at this repository?

- A. YES
- B. NO

5. Would it be of benefit to your organization to have this repository or data base :
(please circle)

- A. STORE DATA AND INFORMATION ONLY FOR RETRIEVAL?
- B. STORE AS WELL AS HAVE AN ANALYSIS CAPABILITY?
- C. PREPARE AND PROCESS IMAGES?
- D. OTHER: _____

6. How would you prefer to OBTAIN data from this repository:

- A. FROM MAGNETIC MEDIUM (e.g. tapes, disks)
- B. ELECTRONICALLY VIA A NETWORK
- C. PRINT (NON-ELECTRONICALLY)

7. How would you prefer to CONTRIBUTE data to the repository?

- A. PRINT (NON-ELECTRONICALLY)
- B. ELECTRONICALLY VIA A NETWORK
- C. MAGNETIC MEDIUM

8. If some data analysis is a capability of this repository center(s), would you be willing to visit the center(s) to perform data analyses that you could not do in your own facility?

- A. YES
- B. NO
- C. UNDECIDED

DATA FACILITY QUESTIONNAIRE

9. If some image preparation and processing is a capability of this center(s), would you be willing to visit the center(s) to perform image processing that you could not do in your own facility?

- A. YES
- B. NO
- C. UNDECIDED

10. Would your organization be willing (or able) to contribute some (or all) of the specialized resources (personnel, hardware, software) required in performing the ATP data base functions?

- A. YES (Please state what functions you could provide)
- B. NO
 - B.1 NO, BECAUSE OF SECURITY REASONS
 - B.2 NO, BECAUSE OF POSSIBLE COMPETITION EXCLUSIONS THAT CAN BE ASSOCIATED WITH THE DATA BASE FUNCTION

*** CONTRIBUTOR COMMENTS AND SUGGESTIONS ***

Please suggest other organizations that should be included in this study.

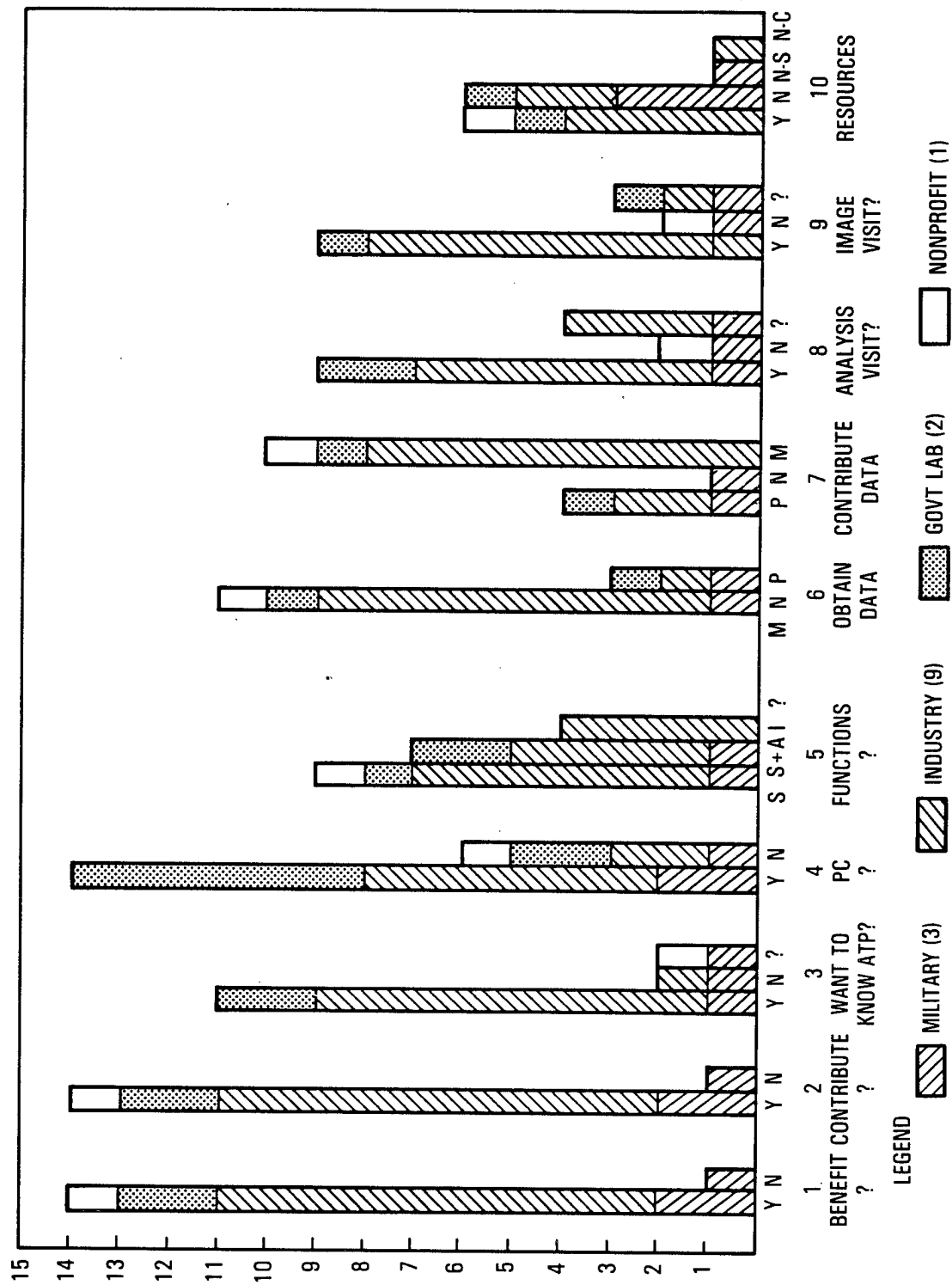


Figure A-1. Acquisition, Tracking, and Pointing Database Questionnaire Response

APPENDIX B

DETAILED DATA CENTER FACILITY QUESTIONNAIRE

POSSIBLE FUNCTIONS OF THE ATP DATABASE

Listed below are possible functions that could be implemented by the ATP Database.

Task 1 - Data Collection, Storage, Indexing and Dissemination

- 1A) Directory of Sources of Information
- 1B) Index to individual data media
- 1C) Repository of selected data for re-distribution

Task 2 - Basic Data Processing

- 2A) Quality Assessment of individual data sets
- 2B) Simple Re-Formatting of data sets
- 2C) Encourage Uniformity of data sets (Standards)

Task 3 - Scenes

- 3A) Comparison to Standard Reference Scenes

Task 4 - Cross-Correlation

- 4A) Cross-Correlation between data sets and models

Task 5 - User Support services - Analysts

- 5A) Technical analyst support
- 5B) Extension and generalization of data

Task 6 - User Support services - Data Processing

- 6A) Classified processing facilities
- 6B) Large Computer processing facilities
- 6C) Specialized Image display and generation facilities

Task 7 - Government Sponsor Support services

- 7A) Repository for contractual products

TASK 1 - DATA COLLECTION, STORAGE, INDEXING AND DISSEMINATION

1A) DIRECTORY OF SOURCES OF INFORMATION

Contents: Organization names, contact names, address and telephone numbers of groups known to hold SDIO/DE ATP data sets and/or data results from models. Brief summary of types of data sets stored and primary usage. One entry per class of datasets.

Output: Periodic distribution via printed reports.

Schedule: ASAP, data collection starting January 1986.

YES NO Question 1.A.1: Would such a directory be of use to
your organization?

1B) INDEX TO INDIVIDUAL DATA MEDIA

Input: Indices to experiment measured data and to significant modelled data. One entry per dataset.

Contents: Possible data fields include: experiment or model name, description of data, physical location of data, media type, media unique serial number, significant experiment parameters, target type, name and version number of program code, organization, contact name, processing comments, dates of original acquisition and most recent processing; reference to other support material (eg, operator logs), etc.

Output: Data Base files, suitable for sorting and searching. Periodic distribution via printed reports and possibly via IBM PC compatible floppies.

Schedule: Data collection starting in the near future

YES NO Question 1.B.1: Would such an Index be of use to your organization?

Question 1.B.2: What data should be included in the index? Any additions / deletions to the above list?

YES NO Question 1.B.3: Does your organization already maintain an electronic index to the data at your site?

YES NO Question 1.B.4: Would you be willing to publish in the Index entries to the data held by your organization?

YES NO Question 1.B.5: Would you be interested in participating in defining an Artificial Intelligence 'Expert System' which would assist technical staff in locating relevant data?

1C) REPOSITORY OF SELECTED DATA FOR RE-DISTRIBUTION

Input: It is proposed that the repository shall contain copies of selected experiment data and significant model data. It shall have the proper access controls for both classified and proprietary data. It can also serve as an off-site emergency backup for critical data.

Contents: Initially, the facility could store Computer Compatible Tapes (CCT, 6250 BPI), paper and floppy disk documentation, micro-fiche and video tapes. If it proves warranted, it may later store other media such as HDDR and analog tapes.

Output: Upon request and proper authorization, the facility could disseminate copies of data and documentation.

Schedule: Proposed to start data collection Summer 1986

YES NO Question 1.C.1: Would such a repository be of use to your organization?

YES NO Question 1.C.2: Would you request data or documentation from the facility?

YES NO NOT APPLICABLE Question 1.C.3:

Question 1.C.3: What data should be included in the repository? e.g., experiment or model name, approximate time frame, overall data description, storage media, expected volume of data, expected organizations that will use the data

TASK 2 - BASIC DATA PROCESSING

2A) QUALITY ASSESSMENT OF INDIVIDUAL DATA SETS

It is proposed that the Database will contain high-quality, reliable data. In order to assure this, selected data will be reviewed against its documentation and description of contents. Internal consistency checks and overall "reasonableness" tests will be performed. This information, together with comments on locations of interesting data segments (from the original contractor and from the Quality Assessment procedure) will be added to the Index described in task 1B.

YES NO Question 2.A.1: Should the Index contain comments pertaining to Quality Assessment?

YES NO Question 2.A.2: Would the Quality Assessment procedures make the data held in the Repository more valuable to your organization?

2B) SIMPLE RE-FORMATTING OF DATA SETS

When data is acquired in real-time experiments, the emphasis is generally on high speed, dense, efficient storage. The resulting data formats, and recording media such as HDDR tapes, may not be suitable for distribution and use by analysis programs. It is proposed the facility could perform simple re-formatting of the data sets. This might include changing recording density, and re-arrangement of data into formats compatible with user equipment.

YES NO Question 2.B.1: Would your organization request the facility to provide re-formatted data tapes?

2C) ENCOURAGE UNIFORMITY OF DATA SETS (STANDARDS)

It is proposed that the facility will establish and promote (via meetings with users):

- o Standard Header Variable nomenclature, units and usage
- o Uniform data set formats from experiment to experiment, and for model data

It is proposed the facility will acquire or write conversion utilities from individual contractor formats into SDIO/DE standard formats, for use in re-distributing data sets.

It is proposed the facility will acquire or write a Data I/O Subroutine Package ("DISP") which will isolate processing programs and algorithms from the details of actual storage formats, and provide for uniform header variable access. The DISP will be oriented towards N dimensional image data. Data files and records will be preceded by standard descriptors with the data dimensions, storage format, type, header variables and comments on processing history. The DISP will permit user and government sponsors to sequentially chain together arbitrary processing programs and algorithms.

YES NO Question 2.C.1: Would your organization be interested in reducing the number and variety of different data set formats on similar experiment data?

YES NO Question 2.C.2: Would you be willing to participate in establishing standards for Header variables?

YES NO Question 2.C.3: Would you be willing to participate in establishing standards for Data Set formats for SDIO data?

YES NO Question 2.C.4: To the best of your knowledge, does your organization already use a package similar to DISP on this or other projects?

YES NO Question 2.C.5: Would your organization be more likely to request data sets if they were available in a uniform format?

YES NO Question 2.C.6: Would you be willing to tolerate a modest overhead in Data Input/Output in order to achieve independence from specific data set formats?

TASK 3 - SCENES

3A) STANDARD REFERENCE SCENES

It is proposed that the facility could store and maintain standard reference scenes, derived from model data and from extensions of measured data.

These scenes could be used by analysts for comparison of processing modules and algorithms, and for acceptance tests of government programs. Quality Assessment tests would be performed on the standard scenes.

YES NO Question 3.A.1: Would your organization be interested in using standard reference scenes?

YES NO Question 3.A.2: Would your organization be interested in participating in the development of such standard scenes?

TASK 4 - CROSS-CORRELATION

4A) CROSS-CORRELATION BETWEEN DATA SETS AND MODELS

Analysis of individual data sets may not reveal consistent system biases and errors. In order to assist in the quality assessment of data, it is proposed that the facility cross-correlate data across different observations, bands and experiments. It would perform high-level consistency checks between independent experiment observations. Cross comparisons would also be made against the predictions of approved models.

YES NO Question 4.A.1: Would such high-level comparisons make the data held by the Repository more valuable to your organization?

YES NO Question 4.A.2: Would your organization be willing to participate in performing these checks?

TASK 5 - USER SUPPORT SERVICES - ANALYSTS

5A) TECHNICAL ANALYST SUPPORT

In order to perform the above functions, it is necessary to have expertise in a variety of areas in order to provide proper quality assessment and facilitate the use of the data.

It is proposed that, upon request, technical analysts be made available to support user processing of data. The fields covered might include: general technology, phenomenology, system technology, fire control.

This staff could also, upon request, help with analysis of the results of running the approved models. These analyst support functions could be made available under a contractual basis with individual organizations.

YES NO Question 5.A.1: Would your organization draw upon the services of these technical analysts?

5B) EXTENSION AND GENERALIZATION OF DATA

It is proposed that, upon request, approved models be used to generate 'new' data sets via extensions and generalizations of existing measured data. The extensions might include: different aspect angles, different targets, different bands, different pixel sizes, different time frames, etc., with accompanying error bar estimation.

YES NO Question 5.B.1: Would your organization be likely to request such "extended" data sets from the repository?

YES NO Question 5.B.2: Would your organization be interested in helping to develop extensions to measured data?

TASK 6 - UPON REQUEST - USER SUPPORT SERVICES - DATA PROCESSING

6A) CLASSIFIED PROCESSING FACILITIES

In order to perform the above functions, it will be necessary to establish Database Center(s). Computer resources could be made available at these centers to government sponsors and approved users. This could facilitate work by smaller organizations that do not have access to project supported computers at the requisite clearance level. At such centers, a user could typically operate at the Secret level, but might, depending on government requirements, operate at higher security levels for selected data.

Note that the initial plans do not include resources to accomodate user processing.

YES NO Question 6.A.1: Would your organization be interested in using a Secret level computer facility?

YES NO Question 6.A.2: Would your organization be interested in using a Top Secret / Tempest computer facility?

YES NO Question 6.A.3: Would you be willing to have your staff travel to such a facility on a semi-regular basis?

YES NO Question 6.A.4: If you responded NO to the above question, would you use the facility(s) on a regular basis it were delivered to your site via a secure network?

6B) LARGE COMPUTER PROCESSING FACILITIES

Certain algorithms inherently require massive 'number crunching' and/or extended precision. These types of algorithms occur frequently in image processing. Access to a 'Large' computer (eg, CDC, Cray, and/or large array processors) may be necessary in order to produce results within a reasonable period of time. This problem is compounded by the volume of SDIO/DE ATP data to be processed.

YES NO Question 6.B.1: Do you expect that your organization will require access, within the next two years, to a secure 'Large' computer facility?

Question 6.B.2: What computer processing capabilities already exist (or are planned for the near future) at your organization, that are security cleared for project work? Please provide a brief capsule description on an attached page.

6C) SPECIALIZED IMAGE DISPLAY AND GENERATION FACILITIES

It is proposed that the database facility might contain specialized image display and generation equipment. This would permit users to construct time sequence 'movies', create sophisticated high resolution displays, and generate new scenes. This equipment should be physically co-located with the 'large' computer facilities, to permit high bandwidth screen updates.

YES NO Question 6.C.1: Is your organization interested in creating these kind of displays?

Question 6.C.2: What general types of displays do you foresee that your organization will have to create? Please provide examples.

TASK 7 - GOVERNMENT SPONSOR SUPPORT SERVICES

7A) REPOSITORY FOR CONTRACTUAL PRODUCTS

It is proposed that the facility store and index deliverables required by government contracts. These might include program codes and other relevant support materials. The facility would restrict access to the proprietary portions of these materials only to government sponsors.

YES NO Question 7.A.1: Please respond only if you are a Government organization: Would you be interested in such an off-site storage and index capability?

ATP DCF WORKSHOP SURVEY

YES NO OTHER

DIRECTORY OF SOURCES INFO.

1A1 7 0

INDEX TO INDIVIDUAL MEDIA.

1B1 6 1

1B2 (TEXT)

1B3 1 5 1

1B4 7 0

1B5 5 2

Useful?

Already Exist (Electronic Form)

Publish Data from your org.

Participate A.I. Expert Sys?

REPOSITORY ARCHIVES RE-DISTRIBUTION

1C1 6 0 1

1C2 6 1

Useful?

Request Data?

QUALITY ASSESSMENT

2A1 6 1

2A2 6 1

Index contain Q.A. Data?

Data more valuable?

SIMPLE RE-FORMATTING

2B1 6 1

Request re-FMT'D tapes?

ENCOURAGE STANDARD DATA SET FORMATS

2C1 5 1

2C2 5 2

2C3 4 3

2C4 1 4

2C5 3 4

2C6 6 0

Reduce number formats

Stds. Header Var.

Stds. Data Set FMT

1 already use?

Increase Data usage?

Tolerate modest overhead?

STANDARD REFERENCE SCENES

3A1 6 1

3A2 5 2

Useful?

Help develop?

HIGH-LEVEL CROSS-CORRELATE MODELS/DATA

4A1 6 0 1

4A2 3 3 1

Useful?

Help perform?

TECH. ANALYST SUPPORT

5A1 1 5 1

Useful?

EXTEND AND GENERALIZE DATA (DST. ANAL. Models)

5B1 5 2

5B2 6 1

Useful?

Help Develop?

SURVEY (CONT.)

	YES	NO	OTHER	
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				CLASSIFIED PROCESSING FACILITIES
6A1	1	6		Use Secret Level
6A2	0	6	1	Use Top Secret/Tempest
6A3	1	5	1	Travel to
6A4	2	3	1	Use via network?
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6B1	5	2		"LARGE" (CDC, CRAY, ARRAY PROC) REQUIRED (2 YRS.)
6B2				Needed within 2 years
				Text
<hr/>				
6C1	3	4		"SOPHISTICATED" IMAGE PROCESSOR FACILITIES
6C2	(Text)			Useful?
<hr/>				
A1	1	0		RESPONSITORY FOR CONTRACTUAL PRODUCTS
				Useful? (only one government org. responded)